

REMARKS

At the time the present Office Action was mailed (February 19, 2009), claims 1-78 were pending. In this response, claims 13, 24, 26, 27, 32, 41, 42, 46, 48, 52, 59-62, 64, 65, 71, 72, 74 and 78 have been amended, and claims 38 and 49 have been canceled, in an effort to expedite prosecution, without prejudice and without commenting on or conceding the merits of the outstanding claim rejections. Accordingly, claims 1-37, 39-48 and 50-78 are currently pending. Following is an explanation of the amendments to each of the amended claims identified above, as required by 37 C.F.R. § 1.173(c) and MPEP § 1543:

- Claim 13 has been amended to eliminate the phrase "the at least one wing having a sweep angle of up to about ten degrees, the at least one wing including:". Claim 13 has been further amended to replace the phrase "a forward airfoil element having an upper surface and a lower surface; an aft airfoil element having an upper surface and a lower surface; an internal structure including at least one spar having a sweep angle of up to about ten degrees; and" with the phrase "the wing having an upper surface, a lower surface, and an internal structure including at least one spar". The applicants respectfully submit that the foregoing amendments are supported by, *inter alia*, Figures 6A, 6B, 7A, 7B and column 2 at lines 62-67 of U.S. Patent No. 6,293,497 (the "'497 Patent"), upon which this reissue application is based.
- Claim 13 has also been amended to replace the phrase "an airfoil structure coupled between the first and second airfoil elements, the airfoil structure" with the phrase "a trailing edge device carried by the wing, the trailing edge device having an upper surface and a lower surface, the upper surface of the trailing edge device being recessed away from an aft-extended contour of the wing upper surface in a thickness direction along its entire length when in a neutral, undeflected position, at least one of the wing and the trailing edge device". Support for the foregoing amendment may be found, *inter alia*, at Figure 6A of the '497 Patent.
- Claim 13 has been further amended to replace the phrase "having a slot that allows airflow from the forward airfoil element to the aft airfoil element," with the phrase "having a spanwise slot that allows airflow from the wing to the trailing edge device, the slot having an aft-facing exit

opening at an offset between the upper surfaces of the wing and the trailing edge device, the offset being in the thickness direction,". Support for the foregoing amendment may be found, *inter alia*, at Figure 6A of the '497 Patent.

- Claim 13 has been further amended to replace the phrase "the airflow structure diverts some of the air flowing along the lower surface of the forward airfoil element through the slot to flow over the upper surface of the aft airfoil element, the lower surface of the forward airfoil element and the lower surface of the aft airfoil element being shaped to provide an efficient cross section for a main structural box of the wing" with the phrase "the slot diverts some of the air flowing along the lower surface of the wing through the slot to flow over the upper surface of the trailing edge device, the lower surface of the wing and the lower surface of the trailing edge device being shaped to provide an efficient cross section for a main structural box of the wing". Support for the foregoing amendment may be found, *inter alia*, at Figure 6A of the '497 Patent.
- Claim 24 has been amended to replace the phrase "the slot extends over at least approximately a full span of the at least one wing" with the phrase "the wing includes an aileron, and wherein the slot extends spanwise through a region of the wing containing the aileron". The applicants respectfully submit that support for this amendment may be found, *inter alia*, at Figures 1B, 1C, and 3-5 of the '497 Patent, and at col. 3, lns. 9 and 10 of the '497 Patent.
- Claim 26 has been amended to replace the phrase "the airfoil structure is movable to form a second slot aft of the first slot and divert additional air from the lower surface of the forward airfoil to the upper surface of the aft airfoil" with the phrase "the slot is a first slot, and wherein the trailing edge device is movable relative to the wing to form a second slot forward of the first slot and divert additional air from the lower surface of the wing to the upper surface of the trailing edge device". Support for the foregoing amendment may be found, *inter alia*, at Figures 6A and 6B of the '497 Patent, and col. 6, lns. 46-63 of the '497 Patent.
- Claim 27 has been amended to replace the phrase "the forward and aft airfoil elements" with the phrase "the wing and the trailing edge device". Support for this amendment may be found, *inter alia*, at Figures 1B, 1C, 6A and 6B of the '497 Patent.
- Claim 32 has been amended to eliminate the phrase "the at least one wing having a sweep angle of up to about ten degrees," and to replace the

phase "having a sweep angle of up to about ten degrees" with the phrase "extending in an at least generally straight line from one side of the fuselage to the other". Support for this amendment may be found, *inter alia*, at Figures 1B and 1C and col. 8, lns. 24-43 of the '497 Patent.

- Claim 41 has been amended to replace the phrase "the slot extends over at least approximately a full span of the at least one wing" with the phrase "the wing includes an aileron, and wherein the slot extends spanwise through a region of the wing containing the aileron". Support for this amendment may be found, *inter alia*, at Figures 1B, 1C and 3-5 of the '497 patent, and at col. 3, lns. 9 and 10 of the '497 patent.
- Claim 42 has been amended to replace the phrase ", the at least one wing further including:" with the phrase "; and". Claim 42 has been further amended to replace the phrase "a forward airfoil element" with the phrase "a flap assembly that includes a forward airfoil element". Claim 42 has been further amended to replace the phrase "being spaced apart from a part of the forward airfoil element by a slot" with the phrase "being spaced apart from a part of the forward airfoil element by a fixed first slot". Claim 42 has been further amended to replace the phrase "the forward airfoil element to flow over the upper surface portion of the aft airfoil element, the aft airfoil element overlapping the forward airfoil element by a distance at least approximately equal to three percent of a combined chord length of the two airfoil elements," with the phrase "the wing to flow over the upper surface portion of the aft airfoil element, the slot having an aft-facing exit opening at an offset between the upper surface of the wing and the upper surface portion of the aft airfoil element, the offset being in the thickness direction, and wherein the forward airfoil element and the aft airfoil element are moveable as a unit relative to the wing to open a second slot between the forward airfoil element and the wing". Support for the foregoing amendments may be found, *inter alia*, at Figures 6A and 6B of the '497 patent.
- Claim 46 has been amended to replace the phrase "the slot is configured to remain open at all flight conditions," with the phrase "the wing overlaps the trailing edge assembly by three percent of a combined chord length of the wing and the flap assembly when the flap assembly is stowed". Support for the foregoing amendment may be found, *inter alia*, at col. 6, lns. 54-55 of the '497 patent.
- Claim 48 has been amended to replace the phrase "the slot extends over at least approximately a full span of the at least one wing," with the phrase "the wing includes an aileron, and wherein the slot extends spanwise

through the region of the wing containing the aileron". Support for the foregoing amendment may be found, *inter alia*, at Figures 1B, 1C and 3-5 of the '497 patent, and at col. 3, Ins. 9 and 10 of the '497 patent.

- Claim 52 has been amended to replace the phrase "at least one wing having a leading edge and an upper surface, the upper surface being shaped to include at least one transonic region during flight, the at least one wing further including: a forward airfoil element having an upper surface portion and a lower surface portion: and" with the phrase "at least one wing having a leading edge, an upper surface, and a lower surface, the upper surface being shaped to include at least one transonic region during cruise flight; and". Claim 52 has been further amended to replace the phrase "an aft airfoil element coupled to the forward airfoil element, the aft airfoil element having an upper surface portion and a lower surface portion, at least part of the aft airfoil element being spaced apart from a part of the forward airfoil element by a slot" with the phrase "a trailing edge device carried by the wing, the trailing edge device having an upper surface and a lower surface, the upper surface of the trailing edge device being recessed away from an aft-extended contour of the wing upper surface in a thickness direction along its entire length when in a neutral, undeflected position, at least one of the wing and the trailing edge device having a spanwise slot". Claim 52 has been further amended to replace the phrase "the slot being configured to be open during cruise flight to divert some of the air flowing along the lower surface portion of the forward airfoil element to flow over the upper surface portion of the aft airfoil element" with the phrase "the slot having an aft-facing exit opening at an offset between the upper surfaces of the wing and the trailing edge device, the offset being in the thickness direction, the slot being configured to be open during cruise flight to divert some of the air flowing along the lower surface of the wing to flow over the upper surface of the trailing edge device". Support for the foregoing amendments may be found, *inter alia*, at Figures 6A, 6B, 7A, 7B and column 2, Ins. 62-67 of the '497 patent.
- Claim 59 has been amended to replace the phrase "the slot extends over at least approximately a full span of the at least one wing" with the phrase "the wing includes an aileron, and wherein the slot extends spanwise through a region of the wing containing the aileron". Support for the foregoing amendment may be found, *inter alia*, at Figures 1B, 1C and 3-5 of the '497 patent, and at col. 3, Ins. 9 and 10 of the '497 patent.
- Claim 60 has been further amended to replace the phrase "the aft airfoil element includes a forward portion and an aft portion, at least one of the forward portion and the aft portion being moveable relative to the other to

form a second slot forward of the first slot and divert additional air from the lower surface of the forward airfoil to the upper surface of the aft airfoil" with the phrase "the trailing edge device includes a forward portion and an aft portion, the forward portion and the aft portion being moveable as a unit relative to the wing to form a second slot forward of the first slot and divert additional air from the lower surface of the wing to the upper surface of the trailing edge device". Support for the foregoing amendment may be found, *inter alia*, at Figures 6A and 6B of the '497 patent, and column 6, lns. 46-63 of the '497 patent.

- Claim 61 has been amended to replace the phrase "aft airfoil element" with the word "wing", and to replace the phrase "forward airfoil element" with the phrase "trailing edge device," and to replace the phrase "two airfoil elements" with the phrase "wing and the trailing edge device". Support for this amendment may be found, *inter alia*, at Figures 6A and 6B of the '497 patent.
- Claim 62 has been amended to replace the phrase "the at least one wing including: a forward airfoil element having an upper surface and a lower surface; an aft airfoil element having an upper surface and a lower surface; an internal structure including at least one spar having a sweep angle of up to about 10 degrees;" with the phrase "at least one wing, the at least one wing having an upper surface and a lower surface; an internal structure including at least one spar;". Claim 62 has been further amended to replace the phrase "an airfoil structure coupled between the first and second airfoil elements, the airfoil structure having a spanwise slot that allows airflow from the forward airfoil element to the aft airfoil element" with the phrase "a trailing edge device carried by the wing, the trailing edge device having an upper surface and a lower surface, the upper surface of the trailing edge device being recessed away from an aft-extended contour of the wing upper surface in a thickness direction along its entire length when in a neutral, undeflected position, at least one of the wing and the trailing edge device having a spanwise slot that allows airflow from the wing to the trailing edge device". Claim 62 has been further amended to replace the phrase "the forward airfoil element through the slot to flow over the upper surface of the aft airfoil element" with the phrase "the wing through the slot to flow over the upper surface of the trailing edge device". Claim 62 has been further amended to eliminate the phrase "the lower surface of the forward airfoil element and the lower surface of the aft airfoil element being shaped to provide an efficient cross-section for a main structural box of the wing". Support for the foregoing amendments may be found, *inter alia*, at Figure 6A of the '497 patent.

- Claim 64 has been amended to replace the phrase "claim 52" with the phrase "claim 62". Claim 64 has been further amended to replace the phrase "the slot extends over at least approximately a full span of the at least one wing" with the phrase "the wing includes an aileron, and wherein the slot extends spanwise through a region of the wing containing the aileron". Support for the foregoing amendment may be found, *inter alia*, at Figures 1B, 1C and 3-5 of the '497 patent, and at col. 3, Ins. 9 and 10 of the '497 patent.
- Claim 65 has been amended to replace the phrase "comprising forming at least a portion of an aircraft wing by coupling a forward airfoil element to an aft airfoil element" with the phrase "comprising coupling a trailing edge device to a wing." Claim 65 has been further amended to replace the phrase "with the aft airfoil element overlapping the forward airfoil element by a distance at least approximately equal to three percent of a combined chord length of the two airfoil elements" with the phrase "with the wing overlapping the trailing edge device by a distance at least approximately equal to three percent of a combined chord length of the wing and the trailing edge device". Claim 65 has been further amended to replace the phrase "with a slot positioned between at least part of the forward airfoil element and at least part of the aft airfoil element" with the phrase "with a spanwise slot positioned between at least part of the wing and at least part of the trailing edge device". Claim 65 has still further been amended to replace the phrase "the forward airfoil element to flow over an upper surface of the aft airfoil element" with the phrase "the wing to flow over an upper surface of the trailing edge device, the upper surface of the trailing edge device being recessed away from an aft-extended contour of the wing upper surface in a thickness direction along its entire length when in a neutral, undeflected position, the slot having an aft-facing exit opening at an offset between an upper surface of the wing and the upper surface of the trailing edge device, the offset being in the thickness direction". Support for the foregoing amendments be found, *inter alia*, at Figure 6A of the '497 patent.
- Claim 71 has been amended to replace the phrase "positioning the slot to extend over at least approximately a full span of the aircraft wing" with the phrase "attaching an aileron to the wing and positioning the slot to extend spanwise through a region of the wing containing the aileron". Support for the foregoing amendment may be found, *inter alia*, at Figures 1B, 1C and 3-5 of the '497 patent, and at col. 3, Ins. 9 and 10 of the '497 patent.
- Claim 72 has been amended to replace the phrase "coupling a forward airfoil element to an aft airfoil element to form at least a portion of an

aircraft wing" with the phrase "coupling a trailing edge device to an aircraft wing". Claim 72 has been further amended to replace the phrase "forward airfoil element" with the word "wing", and to replace the phrase "aft airfoil element" with the phrase "trailing edge device". Claim 72 has been further amended to insert the word "a" before the phrase "generally similar shape", and to replace the phrase "along a lower surface of the forward airfoil element to flow over an upper surface of the aft airfoil element" with the phrase "along a lower surface of the wing to flow over an upper surface of the trailing edge device". Support for the foregoing amendments may be found, *inter alia*, at col. 7, Ins. 61-64 of the '497 patent.

- Claim 74 has been amended to replace both instances of the phrase "forming at least a portion of" with the phrase "coupling a trailing edge device to". Support for the foregoing amendments may be found, *inter alia*, at Figures 1B, 1C and 3-5 of the '497 patent.
- Claim 78 has been amended to replace the phrase "comprising positioning the slot to extend over approximately a full span at the aircraft wing" with the phrase "attaching ailerons to the wing and positioning the slot to extend spanwise through a region of the wing containing the ailerons". Support for the foregoing amendments may be found, *inter alia*, at Figures 1B, 1C and 3-5 of the '497 patent, and at col. 3, Ins. 9 and 10 of the '497 patent.

Application Status

The status of the above-captioned application at the time the present Office Action was mailed (February 19, 2009) is as follows:

(A) Claims 13-18, 23, 24, 26-37, 40-64 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,790,106 to Sweeney et al. ("Sweeney");

(B) Claims 13, 20-22, 25, 32, 38, 39 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,362,659 to Razak ("Razak");

(C) Claims 65-78 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sweeney;

(D) Claims 13-41, 47, 48, 58, 59, 62-64, 70, 71, 77, 78 stand rejected under 35 U.S.C. § 112, first paragraph;

(E) Claims 14, 18, 19, 34, 35, 38, 64 stand rejected under 35 U.S.C. § 112, second paragraph;

(F) Claim 78 was objected to because of an informality;

(G) Claim 19 was indicated to be allowable if rewritten to overcome the rejections under 35 U.S.C. § 112, and to include all of the limitations of the base claim and any intervening claims; and

(H) Claims 1-12 are allowed.

Telephone Interview

The undersigned attorney would like to thank the Examiner for engaging in telephone interviews on May 13, 2009 and June 9, 2009 to discuss the outstanding claim rejections and the applied art. In addition to the discussing the Sweeney and Razak references, the undersigned attorney and the Examiner discussed U.S. Patent No. 2,207,453 to Blume ("Blume"). During the telephone interview, the Examiner and the undersigned attorney discussed amendments to claim 13, which are generally reflected in the foregoing list of pending claims. The Examiner provisionally indicated that the Section 102 and 103 rejections of claim 13 would be withdrawn in light of the foregoing amendments. The Examiner further indicated that the foregoing amendments patentably distinguish claim 13 over the Blume reference, alone or in combination with Razak and/or Sweeney. The foregoing and following remarks reflect the foregoing agreement and further agreements reached during the telephone interviews. Accordingly, applicants respectfully request that this paper constitute applicants' Interview Summary. If the Examiner notices any deficiencies in this regard, he is encouraged to contact the undersigned attorney.

A. Response to the Section 103 Rejections of Claims 13-18, 23, 24, 26-37 and 40-64

Claim 13 has been amended in a manner consistent with the agreement reached with the Examiner during the May 13 and June 9, 2009 telephone interviews. Accordingly, the Section 103 rejection of claim 13 should be withdrawn. Claims 14-18, 23, 24, 26-31 depend from claim 13. Accordingly, the Section 103 rejections of these claims should be withdrawn for at least the foregoing reasons and for the additional features of these dependent claims.

Claim 32 has been amended to include the features of claim 38. Claim 38 includes the features of claim 19, which was indicated to be allowable if rewritten to be in independent form. Claim 19 depends from claim 13, and claim 32 includes the features of claim 13 prior to the amendments contained in this paper. Claim 32 has been further amended to eliminate the reference to sweep angle, consistent with the current amendment to claim 13. Accordingly, claim 32 is now in condition for allowance. Claims 33-37, 40 and 41 depend from claim 32 and accordingly, the Section 103 rejections of these claims should be withdrawn for at least the foregoing reasons and for the additional features of these dependent claims.

Claim 42 has been amended to include several features described above with reference to claim 13. Claim 42, as amended, patentably defines over the applied references for at least the reason that neither Sweeney nor Razak nor Blume disclose a slot having the arrangement of claim 42. As discussed during the above-referenced telephone interview, Blume fails to disclose or suggest "a fixed slot" between forward and aft airfoil elements of a flap assembly (see Blume at Figure 1). Claims 43-48, 50 and 51 depend from claim 42 and accordingly, the Section 103 rejections of these claims should be withdrawn for at least the foregoing reasons and for the additional features of these dependent claims. Claim 49 has been cancelled and accordingly, the Section 103 of claim 49 is now moot.

Claim 52 has been amended to include features generally similar to those described above with reference to claim 13. Accordingly, the Section 103 rejections of this claim should be withdrawn for at least the foregoing reasons and for the additional features of this claim. Claims 53-61 depend from claim 52, and accordingly, the Section 103 rejections of these claims should be withdrawn for at least the foregoing reasons and for the additional features of these claims.

Claim 62 has been amended to include features generally similar to those described above with reference to claim 13. Accordingly, the Section 103 rejection of claim 62 should be withdrawn for at least the foregoing reasons and for the additional features of these claims. Claims 63 and 64 depend from claim 62, and accordingly, the Section 103 rejections of these claims should be withdrawn for at least the foregoing reasons and for the additional features of these claims.

B. Response to the Section 102 Rejections of Claims 13, 20-22, 25, 32, 38 and 39

Claims 13, 20-22, 25, 32, 38 and 39 were rejected under 35 U.S.C. § 102(b) as being anticipated by Razak. Independent claims 13 and 32 have been amended in a manner consistent with the agreement reached between the Examiner and the undersigned attorney during the above-referenced telephone interviews and accordingly, the Section 102 rejections of these claims should be withdrawn. Each of claims 20-22, 25 and 39 depend from one of the foregoing independent claims and accordingly, the Section 102 rejections of these claims should be withdrawn for at least the foregoing reasons and for the additional features of these dependent claims. Claim 38 has been cancelled and accordingly, the Section 102 of claim 38 is now moot.

C. Response to the Rejections of Claims 65-78

Claim 65 has been amended to include features generally similar to those discussed above with reference to claim 13. Accordingly, for at least the foregoing reasons and for the additional features of this claim, the Section 103 rejection of claim 65 should be withdrawn. Claims 66-71 depend from claim 65 and accordingly, the

Section 103 rejections of these claims should be withdrawn for at least the foregoing reasons and for the additional features of these dependent claims.

Claim 72 includes, *inter alia*, positioning a slot between at least part of a wing and a trailing edge device "to increase a Mach number at which the aircraft wing undergoes transonic drag rise by about 0.03 compared with an aircraft wing having a generally similar shape without the slot" with the slot "being configured to be open during cruise flight to divert some of the air flowing along the lower surface of the wing to flow over an upper surface of the trailing edge device." None of the applied references disclose or suggest the methodology of claim 72 and accordingly, the Section 103 rejection of claim 72 should be withdrawn. Claims 73-78 depend from claim 72 and accordingly, the Sections 103 rejections of these claims should be withdrawn for at least the foregoing reasons and for the additional features of these dependent claims.

D. Response to the Section 112, First Paragraph Rejections

Claims 13, 32 and 62 were rejected under 35 U.S.C. § 112, first paragraph for including the phrase "a sweep angle for up to about ten degrees." Without commenting on or conceding the merits of this rejection, the foregoing phrase has been eliminated from claims 13, 32 and 62. Claim 38 has been cancelled and accordingly, the Section 112 rejection of claim 38 is now moot. Each of claims 14-37, 40, 41, 47, 48, 58, 59, 63 and 64 depend from one of the foregoing independent claims. Accordingly, the Section 112 rejections of these claims should also be withdrawn.

Claims 23, 24, 40, 41, 47, 48, 58, 59, 63, 64, 70, 71, 77 and 78 were rejected under 35 U.S.C. § 112, first paragraph for disclosing a slot extending over less than or at least approximately the full span of an aircraft wing. With regard to claims 23, 40, 47, 58, 63, 70, and 77, Figures 1B, 1C, 3 and 4 illustrate a slot that extends over less than the entire span of the wing. With regard to claims 24, 41, 48, 59, 64, 71, and 78, these claims have been amended, without commenting on or conceding the merits of

rejections of these claims, to clarify that the slot extends through a region of the wing at which an aileron is positioned, which is supported, *inter alia*, by Figures 1B, 1C, 3 and 4, and the specification at col. 3, Ins. 8-10.

E. Response to the Section 112, Second Paragraph Rejections

Claims 14, 18, 19, 34, 35, 38 and 64 were rejected under 35 U.S.C. § 112, second paragraph. In light of the foregoing amendments to claims 13 and 32, the Section 112, second paragraph rejections of claims 14, 18, 19, 34 and 35 should be withdrawn. Claim 38 has been cancelled and accordingly, the Section 112 rejection of claim 38 is now moot. Claim 64 has been amended to depend from claim 62 and accordingly, the Section 112 rejection of claim 64 is now moot.

F. Response to the Objection to Claim 78

Claim 78 has been amended to correct the informality identified by the Examiner.

G. Response to the Indication of Allowable Subject Matter

Claim 19 was indicated to be allowable if rewritten to overcome the Section 112 rejection and to be in independent form. As discussed above, the amendment to claim 13 obviates the Section 112 rejection of claim 19. In addition, features generally similar to claim 19 are included in claim 38, which depends from claim 32, and which has been incorporated into claim 32.

H. Response to the Indication that Claims 1-12 are Allowed

The undersigned attorney thanks the Examiner for his indication that claims 1-12 have been allowed. These claims have not been amended in this paper.

I. Conclusion

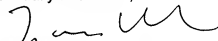
In light of the foregoing amendments and remarks, applicants respectfully submit that the pending application is now in condition for allowance. If the Examiner identifies

any informalities or other matters that may be expediently handled by telephone, he is encouraged to contact the undersigned attorney at (206) 359-3257.

Please charge any deficiency in fees or credit any overpayment to our Deposit Account No. 50-0665, under Order No. 030048094US from which the undersigned is authorized to draw.

Dated: June 19, 2009

Respectfully submitted,

By 

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